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ABSTRACT

The economic benefit that communities derive from in-migration of retired persons has been well recognized in rural development literature. This paper examines the impact of Georgia county attributes on net migration by persons 55 years old and older from 1975 to 1980. Data were obtained from the 1982 County-City Data Book, the U.S. Census Migration Estimates for States and Counties, the Georgia Department of Industry and Trade, and the Georgia Atlas. An empirical model was used to test the independent variables: population, population density, racial homogeneity (percent white), distance to a metropolitan area, crime rate, per capita income, local property tax rate, elevation, and acres of surface water. The linear model was estimated by ordinary least squares. In-migration was positively related to population density, percent white, and acres of surface water, and negatively related to population and distance from a metropolitan area. This paper contains 26 references. (SV)

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The Impact of Community Attributes On In-migration of Elderly Persons

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The Impact of Community Attributes On Migration of Elderly Persons

The economic benefit that communities derive from the in-migration of retired persons has been well recognized in rural development literature. Smith, Hackbart and Van Veen estimated the job creation impact of transfer payments in a economic base model for 110 Kentucky counties. They found that each $4,425 in transfer payments results in the creation of one job. Hirschl and Summers estimate an export base model for 170 randomly selected nonmetropolitan U. S. counties and obtained similar results. They found that an increase of $3,984 in Old Age and Survivor's Insurance result in one new job in the service sector. Kim and Hartwigsen found that elderly migrants had higher pensions than nonmigrants and had completed more years of schooling. Fuguitt and Tordella identify an increasing trend of elderly migration to rural areas. Elderly migrants to rural communities had higher transfer and total income than elderly persons who migrated to urban areas (Kim and Hartwigsen). The recognized local economic benefits associated with elderly migrants and an apparent rural location preference by the higher income elderly has lead several rural development specialists to suggest that rural communities seek to attract retired persons as a strategy for local economic development (Pulver; Summers and Hirschl; Shaffer).

While state and local leadership has been encouraged to develop policies which encourage growth in the retirement sector, i.e., that induce retired persons to move into the state or into particular regions within a state, limited research has been undertaken to identify local factors that influence elderly persons' migration location decisions. This paper reports the results

of a migration model that examines the impact of local amenities on the net migration of persons 55 years old and older. The first section of the paper reviews literature on factors influencing elderly migration. The second section presents a discussion of the empirical model to be estimated. The results and their implications are then discussed.

The Impact of Community Attributes on Migration

A number of factors influence an individual's decision of whether to migrate and the migration destination. Economic considerations are important determinants in the migration decision. The amenities of the destination region also have an important impact on the migration location decision. The relative importance of economic factors versus amenities is, in part, influenced by life cycle considerations of migrants and their families. Marriage, divorce, schooling, employment change, aging of children and retirement are among the factors that influence individuals' or families' migration decisions. Migration models generally have been constructed in a individual or household utility maximization framework (Harris, Tolley and Harrell). Income or employment opportunity is a critical migration determinant. Other factors, however, are also critical to the decision.

Rosen, and Henderson found that individuals will sacrifice income to live in a more favorable climate or a community with less crime. Deaton, Morgan and Anschel found that individuals from Western Kentucky were willing to sacrifice income to return migrate to the region where they were raised.

Location specific amenities also have been found to influence migration location decisions. Cushing, and Goss and Chang, found that temperature was an important determinant of migration. Days of sunshine also have been found

to be a determinant (Vedder and Cooper). Crime rate and temperature (Cebula and Vedder), medical care, temperature and pollution (Cebula), and a variety of climate measures (Graves and Regulska) have been specified as factors influencing individual migration decisions. These variables, however, were not significant in explaining individual elderly's migration decision. The influence of coastline, mountains, and other weather and amenity measures on migration decisions also have been examined. While Graves and Regulaska found these variables not to be statistically significant, Cushing estimated a model in which a location's topography and access to the coast were statistically significant in explaining intrastate migration.

Individuals' propensities to migrate peak during their early- to mid-twenties, declining sharply until retirement (Greenwood). After retirement, individuals with pension income and other financial resources become footloose as they consider migration options independent of employment/income constraints. These post retirement migrants represent the population group that has been targeted as an economic resource by several communities that are seeking to expand and diversify local economic activity (Summers and Hirschl). While migration of the elderly is influenced by income considerations such as cost of living, housing costs, etc., it also is influenced by a range of other quality-of-life factors (Graves and Linneman). There is an increased trend of elderly migration to nonmetropolitan areas (Fuguitt and Tordella).

Serow concludes from a review of cross-national elderly migration studies that elderly persons move because of 1) a desire for residential change and 2) to move closer to family and friends. The desire for residential change, often prompted by retirement, is frequently to a more

favorable climate and healthier environment. It also may be associated with a desire for smaller, cheaper, easier to maintain housing (Serow). Serow concludes that migration decisions to move closer to friends and family are motivated by needs for physical care and emotional support, or because of elderly persons' inability to function independently.

Cebula estimated a model of elderly migration that examined the influence of quality-of-life factors on state level location decisions for elderly migrants. The model includes economic as well as quality-of-life variables. The number of net migrants for a state was the dependent variable in a regression model estimated by ordinary least squares. Availability of medical services, availability of recreation services, and days of sunshine were positively associated with migration. The average amount of cold weather was negatively associated with migration. State average income and state and local taxes were not statistically significant. An air pollution measure that was included in the model was also not significant.

A County Level Elderly Migration Model

In this paper we examine the impact of Georgia county attributes on net migration by persons 55 years old and older. We assume that these persons have retired recently and their gross income is independent of location. Therefore, they migrate to improve their perceived quality-of-life (Serow), rather than to increase their earning capacity. These elderly persons, many of whom receive regular transfer payments in the form of public and/or private pensions, are free to choose a residence independent of employment considerations.

An older person chooses a retirement residence over an array of potential locations, each of which possesses a bundle of attributes. His/her utility is defined by a continuous, twice differentiable function of a vector $\underline{Z}$ of housing and environmental characteristics, a vector $\underline{G}$ of public services, and a composite commodity, X:

(1) $U(\underline{Z},\underline{G},X)$,

and the arguments are defined so that all marginal utilities are positive.

To define the budget constraint we assign a price level P to the composite commodity. The price of locating in a specific community is given by the hedonic price function $H(\underline{Z})$. It describes a location's price as a function of the structural, environmental and county level characteristics, some of which may be public goods. The migrant takes $H(\underline{Z})$ as given in making his/her location choice, but the price paid for locating in a specific community depends on the choice of characteristics. We assume that $H(\underline{Z})$ is an increasing function of each element z.

Local governments are assumed to finance public services with a proportional property tax. Also, it is assumed that each locality within a region is obliged to provide basic services such as education, recreation, police and fire protection, etc., but the level of each service has been previously determined by voter preferences. The tax that a migrant pays is determined by the tax rate required to fund the level of public services offered in the locality and the value of housing, which is determined by attributes associated with the location. To further simplify the choice process it is assumed that all localities provide the predetermined level of public services at minimum cost. A tax function, $T(\underline{G},H(\underline{Z}))$ is defined which

describes the share of income used to finance local public services. $T(\underline{G},H(\underline{Z}))$ is increasing in each element g, the locality's level of public service financing, and it is increasing in $H(\underline{Z})$, the price of the chosen house. The migrant's budget constraint is defined by:

(2) $Y-PX+H(\underline{Z})+T(\underline{G},H(\underline{Z}))$.

Older in-migrants will choose the residence with $\underline{Z}$ and $\underline{G}$ that maximizes utility, subject to their budget constraint. The first order conditions for maximization are:

$$U_x - H_x - T_H H_x = 0$$

(3) $$U_g - T_g = 0$$

$$U_z - P = 0$$

$$Y - PX - H(\underline{Z}) - T(\underline{G},H(\underline{Z})) = 0,$$

where the subscripted arguments denote first derivatives. These equations result in the equilibrium conditions:

(4.1) $MRS_{xg} = (H_x + T_H H_x)/T_g$

(4.2) $MRS_{xz} = (H_x + T_H H_x)/P$,

(4.3) $MRS_{gz} = T_g/P$.

Condition 4.1 states that in equilibrium the retiree's marginal rate of substitution between a location characteristic and public service is equal to the ratio of the characteristic's marginal price to the public service's marginal price. The marginal prices in 4.2 and 4.3 are weighted by the price of the composite good. The marginal price of the location characteristic is defined by the first derivatives of the hedonic function and the tax function with respect to a location characteristic. The marginal price for a public

service is the derivative of the tax function with respect to the public service.

An empirical model of migration can be specified as:

(5) $M_j = M(X, \underline{G}, \underline{Z})$,

where M_j is the net number of elderly migrants to county j.

Data and Model Specification

The empirical model examines the factors that influence elderly migration to 159 Georgia counties. Data used in the analysis are from the 1982 County-City Data Book, the U.S. Census Migration Estimates for States and Counties, the Georgia Department of Industry and Trade, and the Georgia Atlas.

The dependent variable in the model is the number of net migrants aged 55 years old or older to a county from 1975 through 1980. Push and pull factors influence net migration for a specific region (Serow). This analysis attempts to identify the net impact community specific attributes on the distribution of migration choices for persons who have decided to locate in Georgia. The independent variables are defined in Table 1. Means and standard deviations for each variable are presented in Table 2. A discussion of the independent variables follows.

Population, POP, is included in the model as an independent variable as a measure social agglomeration (Richardson). These are social economies that accrue to people in communities with large populations. The economies might include factors such as cultural and recreational facilities, shopping and service facilities and transportation facilities. The social economies associated with population agglomeration are hypothesized to have a positive influence on the number of net elderly in-migrants. POPD, population density,

also is included as an agglomeration measure. Higher population densities are associated with greater retail and service facility concentration. POPD is hypothesized to be positively related to in-migration of elderly. PW, the percentage of the population that is white is included in the model as a measure of population homogeneity. The variable was included to test whether the racial composition of the population influence migration decisions. If migration is mostly by whites, and if they prefer racial homogeneity, then PW should have a positive influence.

Prior research suggests that access to health services is a critical factor in elderly persons' migration location decision (Cebula). Variables that measure local health service levels, such as number of doctors and health care facilities, are highly correlated with each other and with population. Distance to a metropolitan statistical area, MSA, therefore was selected as a health service access measure. Each of Georgia's nine MSAs is a regional health care center. Distance to MSAs, therefore, provides a good measure for rural persons' access to health services. MSA, the distance in miles to an MSA, was hypothesized to have a negative influence on elderly persons' migration location decision, reflecting the impact of distance on access.

Two other variables were included in the model as factors that influence elderly persons' perception of quality-of-life. CRI, the crime rate per 100,000 population, was included as a measure of individual perception of personal safety. This measure has been found to be a significant location determinant in prior state and regional level migration literature (Henderson; Jones and Zannaras; Cebula and Vedder). Freedom from crime is assumed to be a greater concern for elderly persons than for the general migrating

population because of physical decline associated with aging. The crime rate was hypothesized to be negatively associated with migration location decisions. PCI, per capita income, was included in the model as measures of local economic welfare and stability. While elderly may not be interested in local employment opportunities for themselves, the economic stability of the population in a specific county is hypothesized to be an important location determinant. PCI suggests economic welfare and is hypothesized to be positively related to migration.

The effective local property tax rate was included in the model as a local tax price for public services. Property taxes are local governments' means of generating income and reflect the tax cost to persons' for selecting property in a specific community. It is hypothesized to be negatively associated with migration.

Two measures were included in the model as amenity measures. ELEV, elevation, and WAT, acres of surface water. There are similar measures that were included in prior state level migration research (Graves and Regulsha; Cushing). Several weather variables were examined for possible inclusion in the model. There was little variation in the variables across counties in Georgia, however, so they were not included in the model.

Pairwise correlation coefficients were computed for the data used in the analysis. No correlation problems were indicated. Variance inflation factors and condition indexes were used to test for multicollinearity. The tests did not indicate multicollinearity.

A Park-Glejser test, as described in Pindyck and Rubinfeld (p.150), was conducted to examine if heteroscedasticity existed due to a relationship

between population and the error term . The test indicated heteroscedasticity, which was corrected by dividing the original X matrix by $X^{\hat{\delta}/2}$ where $\hat{\delta}$ is the slope coefficient obtained from the test model:

$$\delta \quad \log \hat{\epsilon}_i^2 = \Gamma + \delta \log X_i + U_i.$$

The transformed model is

$$\frac{Y_i}{X_i^{\hat{\delta}/2}} = \alpha \frac{1}{X_i^{\hat{\delta}/2}} + \beta X_i^{1-\hat{\delta}/2} + \frac{\epsilon_i}{X_i^{\hat{\delta}/2}}$$

Results

The linear model was estimated by ordinary least squares. The results are presented in Table 3. Five coefficients were significant at the .1 level. The F statistic for the model is 5.978. The adjusted r-square is .2384.

The population measure, POP, was significant and negative. POPD, population density, was positive and significant. This supports the hypothesis that the social economies of agglomeration associated with higher population densities have a positive influence on elderly persons' migration location decisions. Elderly persons, however, do not appear to be attracted to large communities as residence locations. The other population measure, PW, also was significant and positive, leading support to the held hypothesis.

Distance to a metropolitan statistical area, MSA, was significant with a negative sign. This suggests that the further a county is from a MSA, the lower the number of migrants it will attract. To the extent MSA measures health care access, this result supports the hypothesis that access to health

related services influences the migration location decision of elderly persons. The distance measure also may be capturing the impact of access to other services associated with urban areas.

CRI, the crime rate measure, was not significant. This result may reflect limited variations among adjacent counties on poor information about crime rates.

The water measure, WAT, was significant with the hypothesized positive sign. This suggests that amenities and recreational opportunities associated with lakes and reservoirs attract elderly migrants.

The local tax variable was not significant. This suggests that the marginal difference which variation in local property taxes have on residents' income may not be large enough to influence location decisions. It also might be that costs of obtaining tax information about and computing effective tax rates prevent prospective migrants from obtaining accurate information.

Summary and Conclusions

This paper discusses a county level model of the determinants of elderly migrant's location decision in Georgia. The results suggest that location specific factors are important determinants of elderly migrants location decision. Population density, an agglomeration measure, suggests elderly migrants are attracted to counties with higher densities. Migrants, however, appear to avoid counties with the largest populations. Access to health related services and other urban markets also influence migrants' location decision. Counties closer to MSAs attract more migrants. WAT, a measure for amenities associated with local surface water resources suggests that elderly

migrants are attracted to counties with surface water resources and associated amenities.

This research has provided some insight into which type of county attracts the greatest number of net in-migrants. Those are, counties that are near MSAs, have a more homogeneous population mix, and have access to amenities and activities associated with surface water resources. This information suggests what type of county might benefit from efforts to attract elderly migrants. Additional research is needed, however, to examine how specific attributes of a community influence individual migrants' location decision. This additional research could provide insight into specific actions or investments counties might take to attract migrants.

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Table 1. Definition of Variables

Net MIGRANT	-	Net migrants from 1975-1980, aged 55 years old and older
POP	-	Population in thousands, 1980
POPD	-	Population density, 1980
PW	-	Percent population white, 1980
DIST	-	Distance to MSA in miles, 1980
CRI	-	Number of crimes per one hundred thousand population, 1980
PCI	-	Per capita income, 1980
ELEV	-	Average elevation in thousands of feet, 1980
WAT	-	Acres of surface water, 1980
TAX	-	Effective real property tax rate

Table 2. Means and Standard Deviations of Variables

Variable	Mean	Standard Deviation
MIGRANT	95.55	656.97
POP	34.35	69.74
POPD	1078.98	2160.68
PW	.71	.17
DIST	18.82	18.68
CRI	2554.73	2184.79
PCI	7134.55	1288.13
ELEV	3.100	1.72
WAT	5.37	11.17
TAX	8.64	2.53

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Table 3. Elderly In-migration regression results

Variable	Estimated Coefficient*
Intercept	-203.71 (163.02)
POP	-6.765 (1.517)
POPD	.184 (.045)
PW	350.890 (115.780)
DIST	-1.909 (1.055)
CRI	.017 (.013)
PCI	.005 (.019)
ELEV	-8.877 (13.335)
WAT	2.678 (1.613)
TAX	4.192 (8.256)

*Standard error in parentheses.

Adjusted R-squared .2384